Small Business Innovation Research/Small Business Tech Transfer

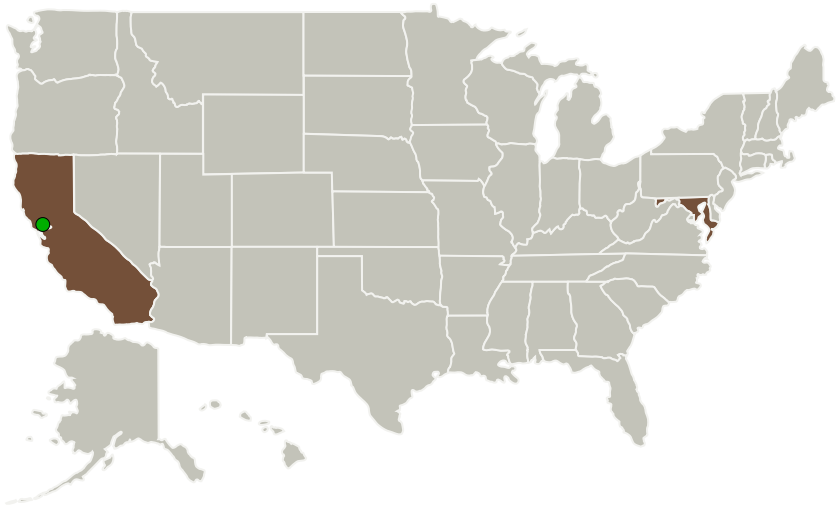
Open|SpeedShop Ease of Use Performance Analysis for Heterogenious Processor Systems, Phase II

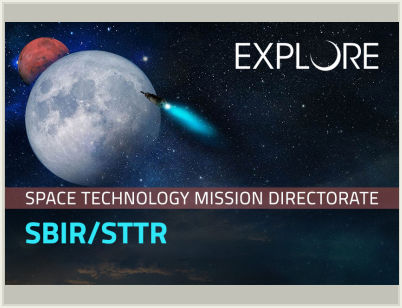
Completed Technology Project (2015 - 2017)

Project Introduction

We propose building upon the modular extensible architecture and existing capabilities of Open|SpeedShop to provide seamless, integrated, heterogeneous processor performance analysis. The NVIDIA GPU and Intel Many Integrated Core (MIC) processors are increasingly important at high performance computing (HPC) laboratories within NASA for use on NASA's high-end computing (HEC) projects because of their ability to accelerate scientific application performance. In order to understand what impact these accelerators are having on performance, tools must succinctly present heterogeneous processor performance information. One of the key goals of this work is to develop and implement innovative methods for presenting the performance information extracted from applications running on both traditional CPU and GPU/MIC processors. Phase II research builds on the progress made in phase I and will include more robust and complete gathering performance information for Intel's MIC architecture. In phase I we built the infrastructure and successfully prototyped a version of Open|SpeedShop that gathered and displayed performance information for applications that ran in the non-offload Intel MIC programming model. For phase II, our research would focus on how to monitor the performance of applications that use Intel's offload programming model. We would also focus research into performance analysis for applications using OpenACC.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Argo Navis Technologies LLC	Lead Organization	Industry	Annapolis, Maryland
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Maryland

Project Transitions

May 2015: Project Start

May 2017: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/137735)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Argo Navis Technologies LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

James Galarowicz

Co-Investigator:

James E Galarowicz

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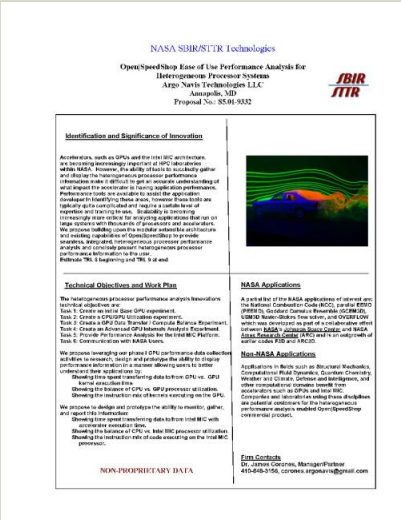
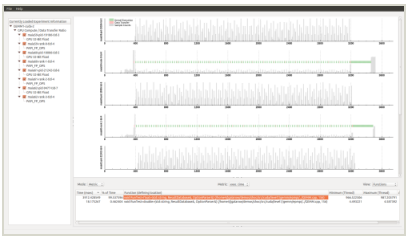
Images



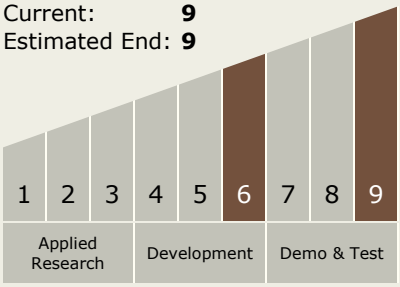
Briefing Chart
Open|SpeedShop Ease of Use Performance Analysis for Heterogenious Processor Systems Briefing Chart
(https://techport.nasa.gov/image/129787)



Final Summary Chart Image
Open|SpeedShop Ease of Use Performance Analysis for Heterogenious Processor Systems, Phase II Project Image
(https://techport.nasa.gov/image/130288)

Technology Maturity (TRL)

Start: **6**
Current: **9**
Estimated End: **9**



Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - TX11.6 Ground Computing
    - TX11.6.2 Automated Exascale Software Development Toolset

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System